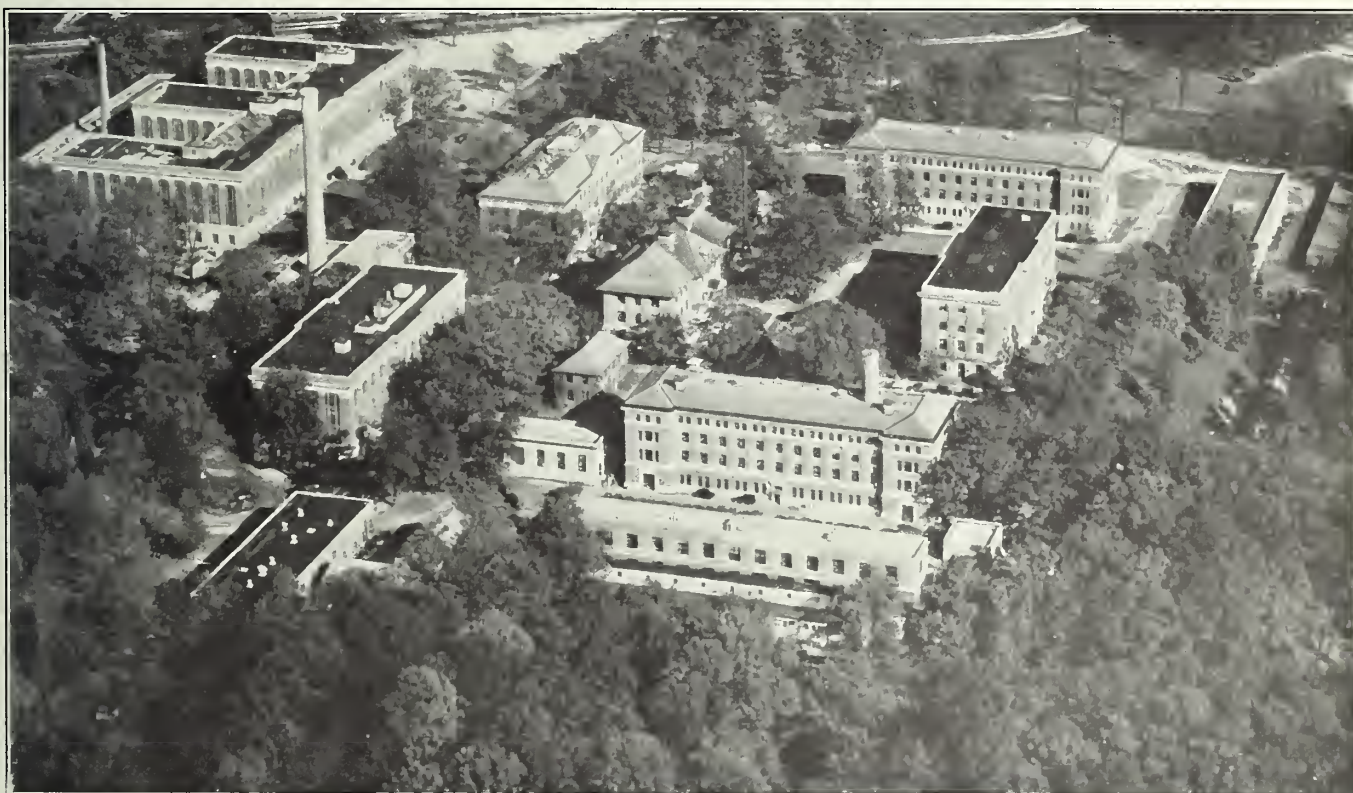


COMMERCIAL STANDARDS MONTHLY



*A Review of Progress in
Commercial Standardization and Simplification*



ISSUED BY THE NATIONAL BUREAU OF STANDARDS OF THE
U. S. DEPARTMENT OF COMMERCE ~ ~ ~ ~ WASHINGTON, D. C., U. S. A.

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AUGUST, 1929

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DIVISIONS OF THE COMMERCIAL STANDARDS GROUP

DIVISION OF SIMPLIFIED PRACTICE, EDWIN W. ELY.

The division of simplified practice was formed in November, 1920, to provide a clearing house or centralizing agency through which the manufacturer, distributor, and consumer groups could meet to discuss their common problems and decide upon eliminations which would prove of mutual benefit to all concerned. The activities of the division are purely cooperative in character. It orders nothing; it dictates nothing; the initiative must come from business itself. It has no regulatory nor police powers to enforce adherence to the simplified-practice recommendations that industry develops under the auspices of the United States Department of Commerce. Its chief function is to serve as a neutral meeting ground for the purpose of bringing together producers, distributors, and consumers, whose aims are sometimes divergent and possibly antagonistic, and who would be unwilling to cooperate, except through some unbiased central agency. Following the approval of the tentative simplified-practice recommendation by a general conference of all interested elements thereof, the project is then presented to the entire industry by letter referendum for its approval and written acceptance, the publication and indorsement of the recommendation on the part of the Department of Commerce being dependent upon acceptance of the program by at least 80 per cent, by volume, of the manufacturers, distributors, and users concerned.

AMERICAN MARINE STANDARDS COM'TEE, A. V. BOUILLON.

The American Marine Standards Committee was organized to promote simplification of practice and elimination of waste in the marine and allied industries. It is composed of individuals, corporations, societies, Government departments, public bodies, or other organizations or groups engaged in building or operating ships, port facilities, and related activities. It works in close cooperation with official agencies, but its activities are controlled by an executive board elected annually by and from the membership. For further information, write direct to the secretary, A. V. Bouillon, Room 713, Department of Commerce, Washington, D. C.

DIVISION OF TRADE STANDARDS, I. J. FAIRCHILD.

The commercial standards unit, now known as division of trade standards, was created on October 1, 1927, for the purpose of aiding those industrial and commercial groups desiring to establish standards of grades, quality, or measurements for their products or their purchases on a purely voluntary basis.

The division functions only at the direct request of the industry concerned. Its procedure is similar to that of the division of simplified practice, except that at least 65 per cent of the industry, by volume of annual production, must accept the commercial standard in writing before it is published by the Department of Commerce. A certification plan is applied

DIVISION OF TRADE STANDARDS—Continued.

on request as a means of increasing the effectiveness of such standards. Provision is made for regular revision of the standard through the appointment of a standing committee to consider periodically any necessity for revision of the standard, in order that it may be kept constantly compatible with progress in the industry.

DIVISION OF SPECIFICATIONS, A. S. McALLISTER.

The duties of the division of specifications are to promote and facilitate the use and unification of specifications. In doing so it carries on activities involving cooperation with technical societies; trade associations; Federal, State, and municipal Government specifications making and using agencies; producers, distributors, and consumers; and testing and research laboratories. The cooperation with technical societies and trade associations includes ascertaining the standardization and specification promoting activities of these organizations, and bringing to their attention the work being done by the commercial standards group. The cooperation with producers involves the compilation of lists of manufacturers who have expressed their willingness to certify to purchasers that materials supplied by them comply with the requirements and tests of certain United States Government master specifications or commercial standards. The division prepares the directories of governmental and nongovernmental testing laboratories; the directory of specifications; and is working on an encyclopedia series of specifications, of which "Standards and Specifications in the Wood-Using Industries" is the first volume which has been issued. It also aids in preparing the Standards Yearbook.

BUILDING AND HOUSING DIVISION, J. S. TAYLOR.

The division of building and housing cooperates with business, technical, and professional groups in practically all its undertakings on building and housing. Its work to modernize building codes and to encourage improved standards for the quality of building construction promotes the practical application of the latest development in design and use of building materials. This division was also formed in 1921.

In furthering home ownership, an effort is made to develop an enlarged, steadier, more intelligent, and more discriminating demand for soundly built dwellings, the largest single class of buildings which the construction industries provide. The division also cooperates with many business and professional groups in efforts to distribute building activity more evenly throughout the year, and to secure less fluctuation from year to year. The work on city planning and zoning has in mind the broad objective of buildings made more useful because well located with respect to other buildings, a well-coordinated street system, and appropriate public works. Good city planning and zoning likewise encourages stability in land values and property uses, and thereby contributes to the demand for durable structures.

Except where otherwise indicated, for further information address

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CORRECTING ENGINE TESTS FOR HUMIDITY

Automobile engines are like humans in many ways, among these being that when the weather is humid, or "muggy," they also are inclined to loaf on the job. Tests made by an automobile company, on a 1-cylinder engine, demonstrated this; more recent tests made by the Bureau of Standards on a well-known type of 6-cylinder engine confirm the previous results. The loss of power due to humidity is found to be directly proportional to the amount of moisture contained in the air.

This does not necessarily mean that the engine has less power when it is raining, as it is quite possible to have more moisture in the atmosphere on a hot, "muggy" day, with no rain, than on a cooler rainy

day. In other words, the loss of power is proportional, not to the relative, but to the absolute humidity.

During the hot summer days, the loss of power between a very dry day and a very humid day may be as large as 10 per cent. One of the reasons why this loss of power with humidity usually is not noticed is that power is dependent on other factors, principally atmospheric pressure and temperature. It frequently happens that a change in one of these factors balances a change in another factor. Other effects of high humidity are to decrease detonation, enrich the mixture, and, in effect, to retard the spark advance. All of these effects tend to give smoother operation.

DETECTING BY PRECISION MEASUREMENTS

By Dr. WILMER SOUDER, *Bureau of Standards*

Scientific identification of criminals through precision methods of measurement and comparison has been the subject of exhaustive investigation in an effort to assist in combating the widespread crime wave.

Scientific precision in crime detection has long been practiced by the police of London, Paris, and Berlin, but due to lack of standards the American authorities have not been able to take full advantage of the most modern methods.

Identifications by comparisons have been made with more or less success for centuries. The application of precision-measurement methods for these purposes is of recent origin and is not generally understood. This lack of understanding of the principles upon which the science is based is responsible for the confusion which sometimes results in evidence introduced in courts of law.

We are so accustomed to the usual methods of description which are only approximate, and because of these approximations are susceptible of no precise interpretations, that we fail to appreciate the extreme accuracy of identifications made possible by precision measurements. When we say we are looking for a man 6 feet tall, of rather heavy build, with dark hair, with a scar on one hand, and with some gold teeth we should not be surprised to find thousands of citizens of the United States who meet the description. If we increase the precision of the description to a man 72½ inches tall, weighing 207 pounds, index finger of left hand amputated at the second joint and with gold crowns on left cuspid and right bicuspid, we may feel sure that comparatively few men in the entire country will meet the specifications, and thus our field of search is conveniently reduced.

The justification for this definite conclusion of positive identification is based on the "law of probability." Briefly and in nontechnical terms this law is interpreted from the fraction which represents the ratio of the number of times a specific characteristic appears divided by the maximum number of appearances possible, and for two or more characteristics appearing simultaneously the probability ratio is represented by the product of the individual fractions.

The Bureau of Standards has taken up the problems of identification of written and typewritten documents, signatures, guns, bullets, etc., in an effort to establish standards for these classes of work. There are a few experts who made identifications in a logical and precise manner, but there are many so-called experts who recognize no limitations, no standards, and no equipment as essential in this field.

The instruments which are now generally recognized as essential for satisfactory results are the products of

years of effort on the part of men who have been actively engaged in this work and who have recognized the value of increased precision in making comparisons of data available for identifications. In each instance the positiveness of identification increases with the number of agreeing characteristics, the narrower limits of measurement, and the increase in precision measurements. When, if ever, these ideal conditions are established there will be fewer conflicting expert opinions.

Precision measurements are the primary standards for identifications of questioned documents. The typewritten page may, at first glance, appear to be a perfect piece of work and not susceptible to analysis of numerous individual characteristics which will prove it to be, beyond question of doubt, the product of one and only one certain machine. Type styles and characteristics distinguishes one make of machine from another. Manufacturers using similar styles of type usually differ in dimensional proportions of the individual letters. For example the (i) is given the same space as the w in the typewritten document, and it is the problem of the artist to design these and other letters in such manner as to minimize what could easily appear to be excessive crowding or isolation of type in the printed work. The modification of letters to avoid these defects gives the first opportunity for precision measurements.

In type made from the same model, or formed against the same die, we may look for defects or lack of all details of perfection over the lines of the letter face. The process of plating and polishing may add defects. The surer source of identification, however, lies in the adjustments of the type on the bars after the machine has been completely assembled. Some letters will be placed high and some low in the line, some will be rotated and some will make contact on one portion of the face before the other portion hits the paper. Adjustments for minimizing these discrepancies are made by inspectors who usually reduce them to apparent uniformity in so far as the unaided eye is able to judge.

The variations are all susceptible to precision measurements which, when made and compared with measurements from other machines, will usually disclose 5 to 10 characteristics sufficient to establish the identity of the machine which produced the document—the product of probability of there existing two machines which will produce documents having all the characteristics specified. For the number of agreements given above and in the absence of unexplained disagreement the ratio usually reduces below the ratio for the number of machines in existence and, therefore, justifies the conclusion of identity.

The excellence of this type of evidence arises from the consistency of the variations; the evidence speaks from every line of the document and barring a few readily explainable variations there are no contradictions. Attempts at destroying these "beacon lights of evidence" through mutilation are seldom successful, as to do so would require a perfect analysis of all defects in the machine and facilities for this type of analysis are limited.

Here, as in all fields of metrology, the value of measurement depends upon the precision of the instruments and the ability of the user. Inaccuracies in either render the results of little value. Experts in this field usually design their own types of measuring instruments and assemble numerous specimens of type-writing from which they draw conclusions as to what constitutes proof of identity.

The identification of handwriting has many points of similarity to the identification of typewriting, to which may or may not be added the feature of attempted disguise. The style of script, the slope, size, and relations of parts of letters, the methods of handling the pen or pencil are important. The absence of consistency and the glaring discrepancies in attempted disguise are readily separated from the parts which show the true handwriting features characteristic of the individual.

Expertness in this field necessitates the acquisition of many qualities of art which are difficult, if not impossible, of specification as belonging to any one particular phase of precision measurement. Experts develop an art which can not be transmitted by instruction. It may be acquired by those who have talents in this field and who are willing to put forth the efforts necessary to master the fundamentals. The author has witnessed methods of procedure and displays of results by experts and is convinced of the correctness of these conclusions.

Ballistic identifications have for their purpose the answer to the question: From what gun was a certain bullet fired? There is often a further question of identifying a case or shell as having been fired in the same gun. Evidence from measurements of guns, bullets, and shells have at present, in many instances, relatively little weight in courts of law except in their general confusion of juries and the development of "a reasonable doubt." This is to a large measure due to the amateurish and incomplete methods pursued by many so-called experts. Properly prepared data on guns and bullets are often unique in the conclusiveness of identifications and often possess definite superiority over what is classed as direct visual evidence. The points of superiority consist of the following: (a) The markings are definite and can not make false or perjured statements. (b) There is no limit to the time available for studying the case. (c) The mental state of the observer need not be confused as is so often the case in visual observations of murders, etc. (d) The findings are available to all parties interested and wishing to verify the conclusions.

The make of a gun is sometimes available from the gross markings on the bullet. Measurements of the land and groove widths, and depths, diameters, and twist markings of the barrel give data for the identification of the make of gun. Further progress must be made from the characteristic markings which arise from imperfections in manufacture of barrel or breech mechanism. Rifling cutters do not have smooth edges. These tools wear with each cut and the small saw-tooth-like projections along the cutting edge produce a constantly changing pattern in the barrel. Bullets pressed against this surface will take these markings and retain them to a remarkable degree even after the penetration of many relatively hard materials. Rust spots and injuries to the inner surface of the barrel provide additional marks of identification. Firing pin and breech markings on shells are equally positive when the shells are available for comparisons.

Briefly, the method of identification consists in comparing these characteristic markings on the questioned bullet or shell with the markings on a test bullet or shell fired through the gun in test. These tests are most satisfactory when made through a comparison microscope of the type perfected by the late Charles E. Waite and by Col. Calvin Goddard, of New York, N. Y. Images of the questioned and test bullets or shells from two microscopes, each focused on a bullet or shell, are combined in a single eyepiece. These images may be caused to make contact with each other at corresponding positions over the surfaces being examined.

Usually there will be a few lines on one surface which do not have their counterparts on the other. These correspond to fouling marks, pieces of metal or powder, rust cavities, etc., which have developed between the two shots in question. Experience shows these to be not contradictory, but properly regarded as further proof of the constant changes taking place with use. Incidentally these accidental changes should not be expected to render two guns more nearly uniform, but rather, by virtue of their promiscuity, to render them more divergent and individualistic in their markings. The identity is established through the agreement of the numerous fine markings present, the agreement of all major markings and the absence of disagreements beyond those which may be ignored from the conditions mentioned above.

Bullets deformed by impacts with bones or other substances require special study, as the dimensions of markings can not be expected to agree precisely with dimensions taken from the gun or from undistorted test bullets. Skill in this field requires ability in the use of the microscope and in the ability to make precision measurements of diameter, angle, and width of markings. Visual and photographic evidence must be complete and readily understood if it is to be of value in evidence.

Eventually it is predicted that this method of identification will be standardized and will furnish one of our most reliable means of identification.

STUDIES ON FIRING OF POTTERY MAY RESULT IN SAVINGS

Because of the heavy losses sustained annually by the ceramic pottery industry on account of the comparatively short life of the average sagger, the Bureau of Standards, is conducting an investigation, the ultimate purpose of which is to determine those properties which affect the life of the sagger. (Pottery, to be successfully fired and glazed, is usually placed in heat-resistant containers known as saggars before being placed in the furnace for firing. These prevent the flames and soot present in the kiln from harming the ware.)

The majority of pottery is fired at temperatures over 1,000° C. (1,832° F.), which is above a bright cherry red heat, and it is essential to know what effect the stresses from heating and cooling have on sagger bodies. Saggars are usually made from suitable mix-

tures of one or more clays and grog crushed to pass sieves of certain sized openings. The grog as a rule is prepared from broken or discarded saggars. In order to determine what properties might cause the saggars to crack or fail in service, a study has been made of two series of saggars fired at 1,230° C. (2,246° F.) and 1,270° C. (2,318° F.). Two clays and a mixture either of coarse or of fine graded grog were used in the mix for these bodies. The data resulting from the tests to which 39 different bodies were subjected indicate that sagger bodies having high strength, but properties that enable considerable yielding under stress, combined with low expansion from heating, crack the less. The coarse-textured bodies resist failure from heat shock to a considerably greater degree than do the fine-textured bodies.

INDUSTRY DEVELOPED THREE NEW SIMPLIFICATIONS IN SECOND QUARTER OF 1929—
14 PROGRAMS NOW OUT FOR ACCEPTANCE

During the second quarter of this year, three new simplified practice recommendations were completed by industry, under the auspices of the division of simplified practice, bringing the total for the fiscal year to 12. The various industries have now promulgated, through the Department of Commerce, a total of 98 completed recommendations. Fifteen recommendations, of which one is a regional recommendation, are now in process of acceptance by manufacturers, distributors, and users.

The introduction of regional recommendations is a further development of the division's effort to cooperate with American business. Hitherto the work has been confined to projects which from their inception were national in scope. It has, however, become increasingly evident that the division of simplified practice has a large field of service in assisting to develop programs covering only a part of the country. For the present it has been decided to limit the development of regional recommendations to (a) natural products or commodities and (b) programs which hold a definite promise of ultimate development into national recommendations.

During the quarter, standing committees of the respective industries conducted surveys and later reviewed a total of nine simplified practice recommendations under the auspices of the division. The average degree of adherence was very satisfactory, having been determined as 89.81 per cent. In addition to these nine, six other industries took action, through their respective committees, in reaffirming their particular recommendations. The action taken, however, was not supported by factual surveys, and no estimate of the degree of adherence is available.

During the fiscal year ended June 30, 1929, a total of 41 recommendations received consideration by their respective standing committees. Compared with the previous fiscal year, in which 38 recommendations were reviewed, the number was increased by 3. The average degree of adherence was 3 per cent less for the present fiscal year than it was for the previous one. This decrease, however, was due to the increased number of recommendations reviewed rather than lack of conformity on the part of industry.

HOSPITAL PLUMBING FIXTURES

The Simplified Practice Recommendation for Hospital Plumbing Fixtures, which was adopted on May 22 at the Department of Commerce by a general conference of plumbing-fixture manufacturers, hospital officials, architects, and other interests, is now before the industry for acceptance. The recommendation as adopted establishes a simplified list of dimensions and types of plumbing fixtures for hospital use. It is the general belief that this recommendation, if accepted and wholeheartedly adhered to by those concerned, will tend to eliminate the constant calls from hospitals for fixtures varying slightly from standard products which cost the manufacturers more to produce than they can reasonably charge and cost the hospitals more to buy than the results justify.

TIGHT COOPERAGE (BARRELS AND KEGS)

Acceptances of the simplified practice recommendation recently adopted for tight cooperage and tight cooperage stock are being received at a very satisfactory rate. The recommendation becomes effective

July 1, 1930, for new production, subject to annual revision by a representative standing committee of the industry. The adoption of this recommendation resulted in a reduction from 20 different capacities or sizes for tight barrels to 8 standard sizes and from approximately 122 different dimensions for staves and heading to 8 standard dimensions for cooperage stock. It is expected this constructive simplification program will result in many economies and benefits to manufacturers, distributors, and users of tight barrels and kegs.

BUFFING WHEELS

At the request of the simplified practice committee of buffing-wheel manufacturers the division has just circularized a list of 600 users for their views regarding the standardization of diameters of buffing wheels with the view of formulating a simplified list of sizes for discussion and adoption at a subsequent general conference of all interests. Recent investigations of the simplified practice committee brought out the fact that the adoption of certain diameters as standard would result in a marked elimination of wasteful cutting of sheeting out of which buffs are made.

LUGGAGE

Acting upon the cordial invitation received from the National Luggage Dealers Association, the division has arranged for a preliminary conference of the officials of that association, with the officials of the Trunk, Luggage, and Leather Goods Manufacturers of America, and others interested, to meet in New York City on August 16, 1929, to discuss the subject of standardization of luggage sizes. The National Luggage Dealers' Association has worked out a list of suggested sizes for wardrobe trunks, dress trunks, steamer trunks, women's suit cases, tourists cases, Pullman cases, and round-edge hat boxes. It has been suggested by several leaders in the luggage industry that a general conference be held under the cooperative auspices of the division of simplified practice to formally adopt a list of recommended sizes to go into effect January 1, 1930. The matter of a general conference and suitable date for such a meeting will be decided upon at the preliminary conference, on August 16.

CARBONATED BEVERAGE BOTTLES

The variety survey covering data on diameter, height, capacity, and weight of glass for carbonated beverage bottles has just been completed, and at the request of the joint simplified practice committee the division of simplified practice is preparing a consolidated report based on the figures furnished by the manufacturers showing the volume of production on the various types now in use. The report will be used by the joint committee in working out a tentative

simplified list of sizes, capacities, etc., for consideration at a general conference to be held sometime this fall under the cooperative auspices of the division of simplified practice.

ICE-CREAM CARTONS AND MOLDS

A simplified practice committee of the International Association of Ice Cream Manufacturers has been engaged in making a survey of the ice-cream industry to ascertain the variety of sizes of cartons used. From the results obtained the committee will formulate a tentative recommendation to standardize the size of the 2-gallon pan molds and corresponding quart and pint cartons and the machine-filled quart and pint cartons. As soon as the committee has completed its report it is planned to hold a general conference of manufacturers, distributors, and users of ice-cream molds and cartons to adopt a simplified practice recommendation under the cooperative procedure of the division of simplified practice.

DENTAL HYPODERMIC NEEDLES

A general conference was held on June 17 at White Sulphur Springs, W. Va., in conjunction with the annual convention of the American Dental Trade Association. The schedule, which has to do with gages and lengths of needles, was approved with slight modifications. The report of the conference will be issued upon completion of the standing committee.

COLOR FOR SCHOOL FURNITURE

A general conference was held on June 28 at the headquarters of the National School Supply Association, Chicago, at which the color for school furniture, "school furniture brown," which was tentatively selected at preliminary meetings of manufacturers, was approved by representatives of all interests. The recommendation will be effective from January 1, 1930. The report of the conference will be issued upon completion of the standing committee.

SHOE GORING

A general conference of all interests will be held on July 23, in New York, N. Y., at which the tentative schedule prepared by the manufacturers' committee of the whole will be developed into a recommendation.

RESTAURANT GUEST CHECKS

A request has been made by the secretary of the Restaurant Check Manufacturers' Association to organize a general conference of all interests about the middle of September, when the tentative schedule will be developed into a recommendation. This proposed schedule was prepared some time ago by a manufacturers' committee of the whole.

PAPER BOARD

A suggestion has been received from the Cameron Machine Co., of Brooklyn, in connection with simplifying the dimensions of rolls of paper board. This was referred to the managing director of the Paperboard Industries Association in Chicago, and he will refer the matter to the simplification committee of that association for action at the July, 1929, meeting at Rye, N. Y.

PACKAGING OF DENTAL PLASTER AND INVESTMENT

A meeting of the simplification committee of the American Dental Trade Association was held in connection with the project at the convention at White Sulphur Springs on June 17. The discussion at the meeting was based on the report made up from questionnaires sent out from this office to manufacturers of plaster and investment, in which they were asked if they could conform to the practice proposed by the simplification committee. The representative of the division of simplified practice was requested to organize a general conference to be held in connection with the meeting of the dealers' section of the association, in Chicago during November.

SHOE-BOX SIZES (LEATHER SHOES)

This project has been inactive for some time, but on June 14, the secretary of the St. Louis Shoe Manufacturers' Association requested the services of the division, submitting a schedule of sizes adopted by the association at a recent meeting, stating that they wished to see these sizes presented to manufacturers outside the association for their approval.

PACKAGING OF FLASH-LIGHT BATTERIES

At the request of the National Wholesale Druggists' Association, the division of simplified practice is making an effort to find out if manufacturers of these batteries are in favor of a uniform packaging system. Replies received to date indicate that they are generally in accord on the proposal. It is intended to organize a preliminary meeting of manufacturers in the near future, to discuss the details, and to prepare a tentative schedule to serve as the basis for a recommendation.

SEPTIC TANKS

The committee of manufacturers appointed at the preliminary conference held on May 2, 1928, has submitted certain recommendations to all manufacturers for suggestions and criticism. As soon as replies have been received by the committee, it is expected that the committee will arrange with the division of simplified practice to hold a general conference during September.

METAL PARTITIONS FOR TOILETS AND SHOWERS

The simplified practice recommendation covering this commodity has received 80 per cent acceptance, and is now in the hands of the printer.

MASONRY OPENING SIZES

A preliminary conference on this subject was held at the Department of Commerce on June 12. The conference included representatives of door and window manufacturers, architects, building material manufacturers and dealers, awning and screen manufacturers, and others interested in sizes of masonry wall openings. The subject was discussed in considerable detail, and the conference authorized the appointment of a representative committee to study the various phases of the proposition and to draft recommendations for later presentation to a general conference of all interests.

INDUSTRIAL TRUCK TIRES

The general conference on simplification of industrial truck tires, mentioned in the June 15 issue of the *COMMERCIAL STANDARDS MONTHLY*, was held at the Department of Commerce on June 6. Recommendations were unanimously adopted by a representative group of manufacturers, distributors, and users of these tires, representing a material reduction in the number of different molds now made. A summary report of the conference has been mimeographed and distributed to all interested associations, firms, and individuals, together with a request for written acceptance in each case. A standing committee was appointed at the conference to sponsor the recommendation which will go into effect on September 1, 1929. Henry F. Schipfel, of the B. F. Goodrich Co., is chairman of the committee.

INDUSTRIAL CASTERS

Further conferences have been held with individual manufacturers and users of industrial casters, with a view of formulating definite projects toward reducing the present variety in this commodity. Users of casters for industrial trucks, both for original equipment and replacement, are particularly interested in bringing about as high a degree of interchangeability as possible. It is expected that a second preliminary conference of caster manufacturers will be held in the near future.

GRAVEL SIZES

The committee on standardization of the National Sand and Gravel Association met in Atlantic City, N. J., on June 28 and discussed the question of establishing a simplified list of gravel sizes. A representative of the division of simplified practice attended the meeting, and the division has been requested to cooperate with the National Sand and Gravel Association in securing the adoption of a minimum list of

standard sizes of gravel, with standard equivalents between square-mesh and round-hole screens for each size. The committee on standardization has already formulated a tentative list, which will be presented to the membership of the association, and to other producers of gravel, for their consideration and action.

REFRIGERATORS (ICE-COMPARTMENT SIZES)

A general conference of refrigerator manufacturers, distributors, users, and refrigerating engineers was held in Washington on June 26, 1929. The simplified practice committee appointed by the manufacturers presented definite recommendations for sizes of door openings and ice-compartment depths for the various types of domestic refrigerators in ordinary use. The conference resulted in unanimous adoption of standard dimensions for ice compartments of "side icers" and "front icers." It was also agreed that standard capacities of ice compartments should be 25, 50, 75, 100,

or 150 pounds, to conform with the standard weights for ice cakes, as stated in Simplified Practice Recommendation No. 96, which was adopted in June, 1928.

FORGED TOOLS

The manufacturers of forged tools revised their simplified practice program on June 18, 1929, in New York City. They found it necessary to add 24 items and to eliminate 16. The effectiveness of the recommendation was proved through survey figures, which showed the degree of adherence to be approximately 93 per cent.

COTTON DUCK

The standing committee representing Simplified Practice Recommendation No. 27, Cotton Duck, reaffirmed their simplified schedule on June 20, 1929, without change. The reaffirmation is effective as of July 1, 1929.

ONE HUNDRED AND TWO MARINE STANDARDS EFFECTED TO DATE

A total of 102 marine standards have been promulgated to date, according to the quarterly report (second quarter of 1929) of the secretary of the American Marine Standards Committee. In his report the secretary calls attention to the fact that the membership of the organization now comprises 357 member bodies. The marine standards so far promulgated are in the following classification:

Hull details.....	50
Engineering (machinery) details.....	27
Ship operation details and supplies.....	24
Special subject.....	1

The Superintendent of Documents, of the Government Printing Office, has been requested to distribute to the membership the following publications recently printed: AMSC50, Fittings for Tubular Steel Cargo Booms; AMSC56, Ship Scupper and Drains; AMSC57, Chinaware for Ship Equipment; AMSC58, Lifeboat Disengaging Apparatus; AMSC59, The Rat Proofing of Ships; AMSC62, Marine Boiler Steel Plates. Other publications are in course of printing and are expected to be ready for distribution at an early date. A complimentary list of all marine standard publications issued to date is available upon application to the secretary of the committee or the division of simplified practice.

1. FLANGED PIPE FITTINGS AND PIPE FLANGES

Preliminary drafts of proposed standards for different zones of pressures—viz, to 125 pounds, 126 to 250 pounds, and 251 to 400 pounds—have been submitted to the Technical Committee on "Engineering Details" for approval. If and when approved and promulgated, these standards are to be appended by data showing standard body thicknesses for different pressures, for cast-iron, semisteel, cast-steel, and bronze fittings; also

by tables showing thicknesses and pressures allowed in marine installations for standard lap-welded or seamless wrought-iron or steel pipe, solid drawn or seamless wrought-iron or steel tubing, and copper pipe.

2. STANDARD UNIFORMS FOR MERCHANT MARINE OFFICERS

A subject committee has been organized to develop specifications for types and grades of uniforms, and a rough draft of proposed specifications for materials, garment manufacturers, and rank and corps insignia is now under consideration by the committee.

3. STANDARD SOCKET FOR HATCH BEAM ENDS

Preliminary drafts of two types have been submitted to the Technical Committee on Hull Details for choice of one to be proposed as standard.

4. PROPOSED STANDARD FITTINGS FOR OIL-TIGHT FITTINGS FOR OIL TANKERS

Preliminary drafts of gasket frame, hinge, dogs, cover support, lifting ring, and auxiliary cover have been submitted to the Technical Committee on Hull Details for ballot vote.

5. THE SHIP'S MEDICINE CHEST AND FIRST AID AT SEA

The Public Health Service has published a book bearing this title. A limited number of the books have been issued by the Bureau of Standards to the secretary of the American Marine Standards Committee for distribution to the membership. The book is intended to form part of the medical equipment for ships standardized by the committee. Additional copies of the book are available from the Superintendent of Documents, Government Printing Office, Washington, D. C., on remittance of \$1.

TO STANDARDIZE ON LOWER BUMPERS

Because motor cars are being built lower than a few years ago, it is proposed to change the specification for standard bumper heights as adopted in 1922 and revised last year by the Society of Automotive Engineers. A subdivision of the standards committee of the society recently recommended that the height above ground of both the front and rear bumper be standardized at 17 inches, instead of the present standard of 18 inches for the front bumper and 19 inches for the rear bumper. The measurement is to the horizontal center line of the bumpers, and is to be the mean height between no-load and full-load position of the frame.

It is also recommended that the mountings for the front bumper have their faces perpendicular to the ground when the car is unloaded, and those for the rear bumper perpendicular when the car is fully loaded. The purpose of this is to assure that the faces of the bumpers will be set to the correct angle to the horizontal to give the best appearance. Unless both front and rear bumpers on all cars are set at approximately the same height, they will not afford maximum protection, as the face of the bumper of one car may be above or below that of another when the cars come into contact.

ACTIVITIES IN TRADE STANDARDIZATION

(Division of Trade Standards, formerly Commercial Standards Unit)

BUSINESS CONFIDENCE

In an editorial in the July issue of the Magazine of Business, Whiting Williams compares the Russian attitude toward business with the American situation in a warning against questionable practices, and in conclusion says:

It is of the utmost concern to all of us that every once in a while some group of stockholders should, by some such gesture, remind even their very most powerful employees that even deficits are rather to be faced than profits made in questionable ways.

The necessity that America's business shall continue to merit the confidence of America's people is so much the keystone to the arch of both our social well-being and our political security and strength that none of us in business or connected in any way with its pursuits and practices dares either commit or countenance anything that might, even in the most indirect manner, contribute a straw to a situation similar to that in Russia.

FUEL-OIL GRADES SUPPORTED BY INDUSTRY

Signed acceptances denoting approval of the six standard grades of domestic and industrial fuel oil have been received from 146 companies representing the more important oil refiners, many distributors, and practically all of the oil-burner manufacturers, which thus assures beyond any doubt the interest in this constructive program and presages its universal adoption.

Present indications, most assuringly point to continuous growth in the use of oil as a domestic and industrial fuel. Production of fuel oil in the period between 1914 and 1927 increased more than 400 per cent. To stimulate this natural trend and further increase the availability and general satisfaction in use, all interests in the fuel-oil industry have enthusiastically cooperated in the formulation of these standards for their mutual benefit.

Heretofore gravity was the only commercial basis on which fuel oils were classified. It is now a well-known fact that of two oils having the same gravity one may be completely satisfactory for a certain type of burner while the other may be almost unusable.

The efficient fuel oil is one that will flow readily, cause no clogging of the burner, and be completely consumed. These points are fixed in the commercial standard grades by the following tests:

Maximum pour points to assure satisfactory flow and storage.

Flash point.—Minimum flash point is usually controlled by law and governs fire hazard, while the maximum flash point insures the required ease of ignition.

Viscosity measures the resistance of oil to flow and the degree to which atomization may be secured.

Distillation.—The 10 per cent point is an index of the ease of ignition, while the 90 per cent point and the end point govern the completeness of combustion.

Water and sediment.—Impurities that reduce the efficiency of fuel oils and may cause clogging of the burner.

The use of these standard grades of fuel oil is being recommended by the members of the American Oil Burner Association and other independent manufacturers, and they should go a long way in restoring order to the industry and instilling confidence in the minds of prospective buyers of oil-burning equipment.

HICKORY GOLF SHAFTS TO MEET STANDARD GRADES

Extreme toughness, strength, and resiliency—the essential trinity of any good golf shaft—are admirably combined in hickory, and as a wood for this purpose it stands in a class all its own.

Of all the specialty products made from hickory, it is doubtful if any are more exacting in their requirements than golf shafts. Knots, bird pecks, worm holes, and cross grain immediately disqualify the raw material, and after a good sound tree is found only a comparatively small portion of the butt log is usually suitable for high-class golf shafts.

After careful selection of the trees, close attention to sawing out the rough squares, and very slow, even drying, the raw material is machine turned into cylindrical forms called dowels. The dowels are further air-dried for a year or more, then conditioned in warm-air kilns, after which they are ready to be

turned into the finished product. This process, accomplished on automatic turning lathes, reduces the shafts to what is known as a "B" form finish. A standard "B" form size has been adopted which is sufficiently large to allow the club maker wide latitude in his judgment as to shaping the shaft for final use.

Stiffness, the cardinal requirement of a superior shaft, has been gaged in the past by the inspector flexing the shaft in his hands; and while this crude method might serve to differentiate between the very stiff and the soft shafts, it is not adequate for the classification of a lot of shafts into several well-defined grades.

A very simple machine has been devised for the mechanical testing of hickory golf shafts that eliminates much of the personal error. Shafts are classified into four grades that will become well-known

divisions of quality to everyone in the golf-equipment industry.

These sizes and grades were unanimously recommended for adoption as a commercial standard by a general conference of all interests of the industry that met in Columbus, Ohio, June 14, 1929.

WALL-PAPER SPECIFICATION APPROVED

Industry has placed its formal approval upon the minimum specifications for wall paper that were recommended by a general conference of all interests on May 25, 1929. Practically all of the more important manufacturers and wholesalers, together with many decorators and users, have signified their approval of the specification as a recommended commercial standard and indicated their willingness to be guided accordingly in their future operations.

ASPHALT ASSOCIATION GETS OUT SEVEN NEW STANDARDS

OTHER SPECIFICATION NOTES

AUTOMOBILE SAFETY

Through its educational campaign for better and safer driving in the hope of reducing automobile accidents to a minimum, the American Automobile Association, in cooperation with other interested organizations, has published for circularization among its member clubs pamphlets relating to brake-testing campaigns and headlight-testing and adjusting campaigns for A. A. A. clubs. As a member of the National Conference on Street and Highway Safety, the A. A. A. has indorsed and is now promoting the movement among its affiliated clubs to support both the uniform motor-vehicle code and the model municipal traffic ordinance. The association has also adopted a code for the promotion of safe driving and the removal of irresponsible drivers from the highways, known as the "A. A. A. Safety—Responsibility." The principles of this code are now being urged for adoption in all States in lieu of compulsory liability insurance or the setting up of State funds to compensate for damages or injuries. In order that its affiliated clubs may secure conveniently and economically standard materials and supplies with which to carry on their work, the A. A. A. has in operation a central purchasing office through which all purchases are made.

REPORT ON STREET TRAFFIC

Since February, 1929, the American Engineering Council, ably assisted by the United States Chamber of Commerce and the American Automobile Association have distributed 10,000 copies of the council's report on Street Traffic Signs, Signals, and Markings. Through the local sections of the American Society of

Civil Engineers, the American Society of Mechanical Engineers, the American Institute of Electrical Engineers, as well as other national engineering societies, this report is being brought to the attention of the municipal authorities throughout the country.

PROTECTION AGAINST LIGHTNING

Two of the five parts of the Code for Protection Against Lightning, formulated under the joint sponsorship of the American Institute of Electrical Engineers and the National Bureau of Standards, have been approved as American Standard by the American Standards Association. These parts deal with the protection of persons, buildings, and miscellaneous property. Part III, which is devoted to the protection of structures containing inflammable liquids and gases, has been approved as American Tentative Standard. The remaining parts, which deal with transmission and distributing lines and apparatus, have not yet been completed.

SPECIFICATIONS FOR PAVEMENT CONSTRUCTION

Publication of revisions of seven specifications relative to pavement construction by the Asphalt Association is one of the early summer trade association accomplishments. The standards, revised to April 10, 1929, have recently been published and are available at the association headquarters. The revised list includes specifications for asphalt macadam surface course (penetration method), asphaltic concrete surface course (fine and coarse graded aggregate type), sheet asphalt binder and surface courses, asphaltic concrete binder and surface courses, asphalt macadam base (penetration method), and asphaltic concrete base (commonly known as black base).

ELECTRICAL DEFINITIONS

A revised report on electrical definitions dated June, 1929, has been issued by the American Institute of Electrical Engineers to supersede the report of August, 1927.

CONSTANT CURRENT TRANSFORMERS

The subcommittee of the electrical machinery committee of the American Institute of Electrical Engineers has prepared a new report relating to tentative standards for constant-current transformers, which is now available through the institute. It contains definitions rating requirements, temperature limitations, and methods of making temperature test, efficiency and losses, dielectric test, insulation resistance, lead markings for transformers, and recommendations for operation.

SWITCHBOARDS AND SWITCHING EQUIPMENT

A report covering proposed standards for switchboards and switching equipment for power and light, not specifically covered elsewhere as apparatus, is now ready for distribution by the American Institute of Electrical Engineers. The standards do not apply to industrial-control equipment or communication switchboards and switching equipment. The general subjects covered by the report are service conditions, definitions rating, temperature limitations, tests, and name plates.

HEATING AND VENTILATION CODE

The American Society of Heating and Ventilating Engineers has recently issued its Code of Minimum Requirements for the Heating and Ventilation of Buildings. The purpose of the code is to standardize as far as practical the installation of heating and ventilation equipment.

DICTIONARY OF TERMS

Considerable progress has been made in bringing about standardization in the terms and descriptions used by carriers and other agencies in reporting on and describing carloads of fresh fruits and vegetables. A dictionary embodying the different terms used by railroads and other shipper organizations, prepared by the Freight Container Bureau of the American Railway Association, is ready for distribution in large numbers to all interested persons by the transportation division of the same organization.

TRENDS IN SMALL-HOUSE DESIGN OUTLINED TO REALTORS

Preliminary findings resulting from a field study of small-house construction in 38 cities were described in an address before the home builders and subdividers division of the National Association of Real Estate

Boards in Boston by James S. Taylor, acting chief of the division of building and housing of the Bureau of Standards. This study was undertaken to find out what sizes, shapes, and kinds of small houses are being built in American cities, how they are finished, and what equipment goes into them. It is expected to furnish facts that will aid in the bureau's program of cooperation with business, architectural, and other groups to encourage better and more economical construction of houses and to promote home ownership on a sound basis.

The speaker noted a distinct improvement in American domestic architecture, which he said "is due in no small measure to the improvement in public taste which is taking place." After pointing out the influence of the automobile on the spreading of home areas into the suburbs, he further stated that "modern features that contribute to saving time and labor in housekeeping, and that make for health and comfort, have come to be demanded in most new houses, and absorb a considerable part of the cost of the house. This has created a pressure to cut down on the cubical contents and has meant somewhat smaller room sizes, lower ceiling heights, and greater attention to economical arrangement of space.

"This process has its limits, and there are already some evidences of a reaction. Where people can afford more space without too much extra labor for housekeeping, they are glad to have it. Some prophets foretold the passing of the dining room in the small house, arguing that, being used only three times a day it was the most expensive space in the house. A good breakfast nook, and well planned arrangements for serving meals at one end of the enlarged living room, so they said, would suffice, but there is no proof yet that they are right. In our survey we found many small houses where a breakfast nook was added, but almost none where the dining room was omitted.

"In the small houses visited in our survey, mostly of five or six rooms, kitchens were more nearly alike in size than any other room. Most of them contained about 100 square feet, with the width about three-quarters of the length, so that 8 feet 10 inches by 11 feet 8 inches would be typical. Living rooms from 11 to 15 feet wide and 15 to 22 feet long, with the width commonly about two-thirds the length, were most frequent. Dining rooms tend to be more nearly square, with about half again as large in area as the kitchens. Bedroom sizes run distinctly larger in 2-story than in 1-story houses. The owner's bedroom in many 2-story houses is over the living room and of about the same size. These figures represent actual practice, which may or may not be the best, and variations are frequent, due to differences in local customs or conditions, and the varying needs of individual families.

"The lowest-priced houses now being built in quantity in the larger cities to-day are of five and six rooms,

with 1-story construction apparently predominating for the 5-room and 2-story for the 6-room size. The 6-room 2-story house is favored more in eastern cities, whereas in cities of the middle and far West the 5-room bungalow is in the lead in the lowest-priced group. In the latter cities, however, the 2-story house actually has six rooms."

BUILDING AND PLUMBING CODES

Copies of the building code and plumbing code tabulation were distributed to building officials and others who had requested it during the past month, according to the division of building and housing reports. The returns showed 858 cities and towns having building codes and 840 cities and towns having plumbing codes. Of these, 281 reported that they were revising their building codes and 191 their plumbing codes.

Sixty-seven cities reported that their building codes had not undergone a major revision for 20 years, 85 for 15 years, and 159 for 10 years. In some cases it is probable that amendments from time to time have operated to keep the requirements more up to date than is indicated on the face of the returns. More than 200 cities reported the use of the recommendations prepared by the Building Code Committee of the Department of Commerce, and half the same number reported use of the recommendations on plumbing prepared by the subcommittee on plumbing. The data obtained on the number of employees in building inspection departments and the allocation of their duties will be used in studies of code administration. A limited number of copies of the tabulation are available to those interested.

GOVERNMENT SPECIFICATIONS NOW KNOWN AS "FEDERAL SPECIFICATIONS"

Specifications adopted and promulgated by the Federal Specifications Board will be known and referred to hereafter as "Federal specifications," instead of "United States Government master specifications," or "Federal Specifications Board specifications," in accordance with recent action of the board.

The Federal Specifications Board has recently promulgated a number of revisions of Federal specifica-

tions, including Manila Rope, No. 61b; Unbleached Cotton Sheeting, No. 301a; Shears and Scissors, No. 361a; Flint Paper, No. 385b; Aluminum Oxide Abrasive Cloth, No. 387b; Emery Cloth, No. 388b; Office Huck Towels, No. 422a; Rigging Leather, No. 483a; and Mattress and Pillow Ticking, No. 615a.

A revision of United States Motor Gasoline, No. 622a, which supersedes the specification included in Federal specifications No. 2d, is believed to be quite an improvement over the old specification, and is a result of considerable cooperation on the part of industry. This specification is intended to cover gasoline for automobiles, trucks, tractors, motor boats, and similar engines. A new specification, known as "Motor Fuel V, No. 623," has been adopted and promulgated, and is intended to be used particularly in winter for such emergency vehicles as ambulances, fire engines, military and naval equipment, and for other equipment under special conditions.

A number of the brushes and brooms specifications have been recently revised and promulgated: Cal-cimine Brushes, No. 396a; Ceiling and Wall Dust Brushes, No. 397a; Flat Fitch Brushes, No. 399b; Hair Floor Sweep, No. 400a; Round Glue Brushes, No. 401b; Flat Glue Brushes, No. 402a; Flat Lacquering Brushes, No. 403a; Marking Brushes, No. 404b; Mottling Brushes, No. 405a; Oval Sash Tool Brushes, No. 406b; Badger Hair Flowing Brushes, No. 512a; Squirrel Tail Hair Flowing Brushes, No. 513a; Skunk Hair Flowing Brushes, No. 514a; Flat Metal Bound Paint Brushes (high grade), No. 515a; Flat Metal Bound Paint Brushes (medium grade), No. 516a; Radiator Bronzing Brushes, No. 517a; Knotted Style Roof Brushes, No. 518a; Stencil Brushes (flag ends cut), No. 519a; Stencil Brushes (flag ends preserved), No. 520a; Flat Varnish Brushes (triple X thickness), No. 521a; Flat Varnish Brushes (double X thickness), No. 522a; Whitewash Brushes, No. 524a; Flat Painters' Dusters, No. 525a; Round Painters Dusters, No. 526a.

Copies of these specifications, which are believed to be a distinct improvement over the old specifications for brushes, may be obtained without charge, by addressing the "Federal Specifications Board, National Bureau of Standards, Washington, D. C."

FACILITATING THE USE OF NATIONALLY RECOGNIZED SPECIFICATIONS

A. S. McALLISTER, *Chief Division of Specifications*

Closely akin are the subjects of standardization, simplification, and specifications. For some time the Bureau of Standards has been assisting industry in promoting the use of nationally recognized specifications. This story will present to the readers of the *COMMERCIAL STANDARDS MONTHLY* an outline of the methods being employed for facilitating the use of

United States Government master specifications (Federal specifications) by governmental and institutional purchasers, Federal, State, county, and municipal.

Before describing the methods referred to, it seems well to call attention to the conditions under which the United States Government master specifications are prepared and to their real commercial significance.

Prior to the organization of the Federal Specifications Board in 1921 each department and establishment of the Government had its own specifications for all materials purchased by it, the specification requirements being often in conflict with each other and seldom in conformity with commercial practice. To avoid duplication of effort in the procurement of material and to insure better utilization of our resources and industries the board was given the duty of not only compiling and adopting standard specifications but also of bringing them into harmony with the best commercial practice wherever conditions permit, bearing in mind the broadening of the field of supply.

Each United States Government master specification promulgated by the Federal Specifications Board is formulated by a technical committee consisting of official representatives of every department and establishment interested in the commodities covered by the specification. Full consideration is given by the technical committee to such advice as can be obtained from interested commercial and industrial concerns. The specification thus prepared by the technical committee is submitted formally to all departments and establishments of the Government and informally to various interested engineering and technical societies through the American Standards Association. All criticisms received are given consideration by the technical committee in placing the specification in final form for promulgation by the board for the mandatory use of the Government departments and establishments in the purchase of material covered by the specification.

It will be understood, therefore, that the United States Government master specifications represent a most serious effort to cover by means of specifications commercially satisfactory commodities for use by the Government in its own purchases. Considered as a whole, the 623 specifications formulated by the Federal Specifications Board are probably the best group of commodity specifications thus far compiled. Many of them are far from perfect, but all of them are kept constantly under consideration for revision.

To the provisions made for revising the specifications and bringing them into harmony with commercial practice in order to broaden the field of supply can be attributed much of the value of the specifications to Federal Government purchasing agencies and other public purchasers and interested organizations. It is fully realized that the specifications must be subject at all times to revision as the state of the art of production improves, as the quality of raw materials available for a given product changes, and as new limitations are imposed on the use of a product. That these conditions have been given serious consideration, and that they exert a controlling influence on the United States Government master specifica-

tions, is shown by the fact that more than 25 per cent of the specifications have already been revised from one to four times since their initial promulgation.

An effective first step in the broadening of the field of supply of commodities covered by United States Government master specifications is taken in the compilation of complete lists of firms manufacturing the general types of commodities which are the subject of these specifications. In compiling such lists use is made of all available governmental and nongovernmental sources of information concerning the manufacturing firms, and this information is checked by direct correspondence with the individual firms. To obtain a list of firms of definite use in connection with any selected specification, there are omitted from the complete list such manufacturers as do not build commodities in accordance with the designated specification, and from the smaller list are omitted the names of such manufacturers as have not as yet expressed their desire to obtain contracts based on the chosen specification and their willingness to certify to the purchaser, when requested to do so, that the commodities delivered under contracts based on this specification do actually comply therewith.

In applying the "certification plan" to the United States Government master specifications serious consideration is given to the exact status of each specification. Selection is being made first of such of the specifications as are believed to be most nearly thoroughly satisfactory in their present form. "Willing-to-certify" lists involving more than 7,500 requests from about 200 firms manufacturing commodities covered by 248 specifications have been compiled and placed in mimeograph form, including 23 specifications relating to bituminous roofing, waterproofing, and paving materials.

When the plans for compiling lists of "willing-to-certify" manufacturers were first formulated, more than 100 outlines thereof were sent to public purchasers and to the officers of technical societies and trade associations having national recognition. The replies showed that the plans would be fully indorsed by consumer organizations, and that the only opposition to the "certification plan" as such (rather than to certain selected specifications to which it might be applied) would come from such organizations as are not truly in favor of real effective standardization.

It was to be expected that technical societies familiar with the formulation of specifications would be in favor of the plan. Correspondence brought to light the fact that many trade associations that might have been assumed to be opposed to the plan, at least initially, were actually very favorably inclined toward it.

It is not to be assumed that all trade associations and all manufacturers are enthusiastically advocating the certification plan. For various reasons certain manufacturers would prefer not to have the certifica-

tion plan applied to commodities sold by them. It is noteworthy in this connection that practically all of these same manufacturers strongly advocate specifications for the materials purchased by them. The fact is that in no case has there not been a considerable number of thoroughly responsible manufacturers anxious to have their names listed among the "willing-to-certify" manufacturers of commodities covered by United States Government master specifications.

The widening application of the certification plan has been welcomed by practically every organized consumer group in the country. Moreover, it has received the indorsement of many officers of national organizations representing producers and distributors, including the National Industrial Council, "a federation of National, State, and local associations organized under the leadership of the National Association of Manufacturers to foster constructive legislation and to oppose enactment of class laws."

In commenting on the progress being made with the certification plan the executive secretary of the council said:

If your department has not already done so, I would most earnestly suggest that you may with great and practical co-operative value communicate on this matter with every one of the State manufacturing associations' secretaries who are members of the advisory committee of this council, as given on the attached list.

Let me further suggest that in any communication you may send to these association executives we would be happy to have you say that the work and cooperative participation in it meets with the warm approval of this council, and specifically urge each one to systematically invite their membership to take an active part in the same.

As I have observed this whole effort by your department, I believe it carries with it one of the most effective media for combating questionable or unethical merchandising and production practices ever conceived. Its strictly voluntary character in my opinion is one of the most constructive works any branch of the Government is carrying on, and it is bound to prove a million times more effective than all the legislative dictums or panaceas, such as indigestible truth-in-fabrics laws could or would accomplish.

For these and other practical reasons I want to assure you that the vast progress your department has already made and its whole purpose in this work under your splendid direction will receive every feasible measure of cooperation we can directly or indirectly extend.

Please keep me advised of your cooperative responses from industrial associations so that anything we can do to be of service in these directions may be done promptly.

Special efforts are being exerted to prevent any misunderstanding on the part of either the manufacturers or the users of the exact significance of the lists of "willing-to-certify" manufacturers. The certificates which the manufacturers state they are willing to issue upon request are to be addressed to the purchaser and not to the Bureau of Standards.

So far as concerns the effectiveness of the certification plan, it is unnecessary for the Federal Govern-

ment or any governmental agency to police the contracts entered into by buyers and sellers of commodities guaranteed to comply with certain specifications. The existing laws of the land relating to contracts are adequate to take care of all such cases.

A manufacturer who places on record the statement that his commodity complies with a United States Government master specification is shortly made to realize that both his customers and his competitors are vitally interested therein and will check the accuracy of the statement and take such steps as may seem necessary or desirable to prevent any manufacturers from "obtaining business under false pretenses." The process of checking the accuracy of statements of this kind made by competing manufacturers is essential for the protection of the manufacturers themselves as well as the consumers. Both trade associations and better-business bureaus have shown themselves to be vitally interested in this subject. By serving as an agency through which the various manufacturers keep watch on their competitors, trade associations can become very active in backing up the certification plan. Nongovernmental organizations making use of nationally recognized specifications can properly render such a service as this but it would seem unwise for the Federal Government to do so—that is, beyond its own needs as a consumer.

In 1923 President Barnes, of the Chamber of Commerce of the United States of America, in discussing the voluntary adoption of standards of quality, said:

In lines of merchandise where conditions warrant the adoption by representative trade associations of certain definite standards of quality or performance, the associations can hold to account any member failing to make delivery up to the standards adopted and incorporated in sales contracts. Disputes arising in connection with such transactions readily lend themselves to settlement by the parties themselves or by commercial arbitration.

Purchasers who might be inclined to do business with unknown or untried manufacturers whose names appear on the "willing-to-certify" lists should not fail to insist upon receiving from such manufacturers properly signed certificates guaranteeing compliance with the specification requirements. Manufacturers who might be somewhat careless in making deliveries under normal conditions are quite apt to select the best specimens from the "factory run" to accompany quality-guaranteeing certificates which they have reason for believing will be looked upon seriously by the purchasers.

In order to avoid delay and confusion, when placing orders requesting certificates from "willing-to-certify" manufacturers, the correspondence should always be conducted with the individual officer of the company whose name appears on the "willing-to-certify" list. This officer can be assumed to be familiar with the

specification and with the plan for issuing certificates, whereas other officers of the same company may be unfamiliar therewith.

Whether or not there is available a list of manufacturers willing to certify to compliance with the requirements of the specification upon which a certain purchase contract is based, the purchaser can protect himself somewhat by requesting that quality-guaranteeing certificates be supplied with the commodities delivered. Honest manufacturers accepting contracts based on a satisfactory specification will always be willing to issue the desired certificates. Such manufacturers and the purchasers should be protected against manufacturers unwilling to place in writing their claims that goods delivered by them comply with the specification requirements.

In any event, the certificates issued by or on behalf of the manufacturer will be given weight according to the reputation for accuracy and reliability of the manufacturer or certifying agency. Manufacturers, certifying agencies, and consumers all will have need for increased testing and inspection services.

Encouraging the very large number of public purchasing agents to make use of the specifications of the Federal Specifications Board broadens the field of supply by inducing a large number of persons to manufacture commodities meeting the requirements of the Federal Government. Moreover, the widening use of the specifications of the Federal Specifications Board serves to draw attention to such modifications as might well be made therein in order to render them satisfactory to the various purchasers and to bring them into harmony with the best commercial practice.

Reference is made herein specifically to United States Government master specifications, as the lists referred to are those of manufacturers willing to certify to compliance with these specifications. However, the plan outlined could readily be, and is being, applied to other groups of nationally recognized specifications in this and other countries. It is to be expected that the application of the plan will be of benefit not only in the general promotion of the use of specifications by both the small and the large consumers but also in the unification of specifications having national recognition.

Reasonable specifications, formulated after a thorough interchange of ideas and experiences of the manufacturer and the user, and setting forth those requirements considered essential to safeguard the consumer without hardship to the manufacturer serve to show to both parties to the contract what service the commodity must render and how it must be manufactured in order to fit it for use. It is to the best interest of all persons concerned that the specification be formulated jointly by both parties to the contract working together harmoniously, each benefiting from the knowledge and experience of the other.

Specifications formulated under proper auspices, recognized alike by both producers and consumers as being reasonable, protect the honest seller from unfair competition, and the buyers from purchasing an inferior product at the price of a better one.

From the point of view of the purchaser there are many advantages to be gained from using proper specifications rather than buying without specifications. To make the specifications thoroughly effective commodity acceptance testing must be resorted to. A fair substitute for such testing—or, rather, a good method of minimizing acceptance testing—is to be found in placing contracts exclusively with manufacturers known to be reliable and accepting from them certificates guaranteeing compliance with the specification requirements. It is not suggested that testing be abolished, but that the great bulk of routine acceptance testing be eliminated and that check testing at convenient irregular intervals be resorted to. In case goods ordered on contracts based on specifications are found not to comply with the specification requirements, the existing laws of the land relating to contracts furnish adequate protection without any special policing.

There is a certain amount of automatic policing of certificates based on specifications when the certificates are placed on the goods in the form of self-identifying quality-guaranteeing labels. Agencies are operating effectively to minimize, if not eliminate, misbranding and mislabeling with intent to deceive. In this work the Federal Trade Commission is receiving the very helpful cooperation of numerous trade associations, the members of which are vitally interested in eliminating such unfair trade practices as the issuing of misleading labels.

It is to be understood, of course, that the labeling system here referred to is inseparably associated with the certification plan and is not to be confused with the many systems now in operation involving labels the exact significance of which is seldom understood by the "over-the-counter" buyer who is therefore somewhat inclined to discredit all labels.

By the widespread application of the quality-guaranteeing labeling system, based on certified compliance with nationally recognized specifications, not only can some of the benefits derived by the large-quantity and medium quantity purchasers from using such specifications under the certification plan be passed along to the small-quantity "over-the-counter" buyer—the nonspecifications-using public—but the specifications-using buyer obtains a measure of protection second in effectiveness only to the much more expensive commodity acceptance testing. Moreover when producers employ these labels, they are afforded considerable protection against the unfair competition of dishonest manufacturers.

Certain manufacturers of dry cells, gypsum, ink, lineoleum, lumber, paint, pipe, Portland cement, soap, and textiles have stated that they are now using, or planning to use, quality-guaranteeing labels with goods manufactured to comply with United States Government master specifications. One of these manufacturers makes three grades of liquid soap, marketed under three different brands. One grade is said to exceed the requirements of the Government specification by a certain percentage, and is priced accordingly; another grade, which is said to "answer every average requirement," is sold at a price somewhat less than that asked for the Government specification soap. The Government specification soap carries the following label:

GUARANTY

This liquid soap is guaranteed to comply with the United States Government specification No. 27 for Liquid Soap as adopted by the Federal Specifications Board, on June 20, 1922, when tested by method shown in circular of the Bureau of Standards No. 124. Copies of specification and method of testing will be sent gratis upon application.

Comments of certain manufacturers using self-identifying labels guaranteeing compliance with United States Government master specifications are of interest in this connection.

Obtains new customers.

In answer to your letter of the 4th, wish to state that we have enjoyed very good responses to our circular on the standardized liquid soap as per copies recently sent you. The surprising thing is that a good many inquiries came in from very large industrial and educational institutions who ordinarily do not pay much attention to circulars, so evidently it drew their attention. Then, too, we have had a lot of favorable comments from school officials who are too busy and have too many things to look after who are pleased to know that at last they are able to buy liquid soap with some assurance of standard quality at a definite price.

Holds customers' business.

It is our impression that the tags guaranteeing compliance with the United States Government master specifications really do a job for us in assuring the customer that he is buying standard merchandise, and in this way assures the continuance of the customers' business.

Comments of certain manufacturers investigating the possibilities of using the quality labeling system are also of interest:

Economic advantages.

We believe that the general use of such a system would be an economic advantage to the ultimate consumers of the Nation, protecting them from their own false ideas of values which have skillfully been built in their minds by exaggerated national advertising campaigns.

Protection to manufacturers and consumers.

The whole plan is a mighty fine idea, affording full protection to both the consuming public and manufacturers alike, and deserves the hearty cooperation of every industry.

In connection with his advertising literature, one of the prominent textile manufacturers certifies that every one of his trade branded sheets "fulfills all requirements of the United States Government master specifications No. 304, for high-count cotton sheets, and No. 305, for high-count cotton pillow cases." Concerning his pipe unions a certain manufacturer states that they "conform to United States Government master specification No. 393" and are "also listed as standard by underwriters' laboratories."

Much interest has been shown in the certification plan and labeling system by a large number of national and local organizations, including chambers of commerce, better-business bureaus, colleges offering courses in commerce and business administration, women's clubs and federations, home-economics teachers, and associations of manufacturers and advertisers. Judging from the correspondence with the officers of these organizations it seems evident that many manufacturers could make effective use of labels showing compliance of certain of their commodities with nationally recognized specifications which may or may not be those of the Federal Government.

The maximum benefit to be derived from the specification method of buying and selling will be obtained when the "nationally recognized specifications" for a chosen commodity has been so formulated as to cover the most satisfactory commodity in the best possible manner, the manufacturers place this commodity in "mass production" in accordance with this specification, the suppliers issue their certificates guaranteeing compliance with this specification, and quality-guaranteeing labels are based on the tests and inspections of this identical specification. The conditions here outlined are ideal and can be realized with few commodities at the present time. However, they would seem to represent a proper goal for the various agencies concerned to strive to reach.

COOPERATIVE RELATIONS OF AMERICAN STANDARDS ASSOCIATION AND THE BUREAU OF STANDARDS IN REFERENCE TO COMMERCIAL STANDARDS

"The following statement of the cooperative relations of the American Standards Association and the division of trade standards of the Bureau of Standards has been formally indorsed by the association and by the bureau, and is issued with their joint approval for the information of all who are interested in industrial standardization:

1. The American Standards Association is the agency through which standardization by trade associations, technical societies, and governmental agencies is advancing in the United States on a broadly national scale. The association is maintained by a group of national organizations, industrial, technical, and governmental (at present 40 in number).

2. The association imparts a definite status to standards which are prepared by industry in accordance with the association's procedure, through declaring them American Standards, after a consensus has been reached among the various groups substantially concerned—producers, consumers, distributors, and general interests.

3. The National Bureau of Standards, through its division of trade standards, is acting as a centralizing agency for industrial and commercial groups requesting its cooperation in the adjustment, application, and promotion of standards that will facilitate production and marketing of the commodities which concern the requesting group. After proper acceptance of such standards by the interests immediately concerned, the bureau publishes them as the "commercial standards" of those interests. Primarily, the effort of the bureau is to serve those groups which have no satisfactory standardization facilities.

4. Since "commercial standards" are obviously of interest to groups immediately concerned with the manufacturing and marketing of specific commodities, such standards are not

considered to have the same status as is imparted to standards approved as American standards by the A. S. A., though it is hoped that some commercial standards will eventually receive such approval. Commercial standards are temporary standards.

5. In the advancement of commercial standards to the status of American Standards, the Bureau of Standards may serve as the sponsor for a given project if it shall appear that such sponsorship is desired by the proponent group and if such assignment is consistent with other sponsorships and with the regular practice and procedure of the A. S. A.

6. With reference to changes or revisions of a standard for which the bureau acts as sponsor, the bureau will, under the A. S. A. procedure, in the same way as other sponsor organizations, assume responsibility for presenting the proposed changes to the proponent group for consideration and action.

7. The foregoing does not apply to simplified practice recommendations, since the bureau endeavors to keep the elimination of unnecessary varieties a separate function.

FIRST AMERICAN STANDARDS ASSOCIATION BOARD OF DIRECTORS ORGANIZED—OTHER A. S. A. NEWS

The first board of directors of the American Standards Association, provided for in the association's new constitution, has been completed and held its first meeting last month. The board of directors is given complete control of the general policies and finances of the association. It includes nine members designated for a period of three years by the memberbodies of the association, in addition to the president, vice president, and junior past president of the association. The members of the board are as follows: Quincy Bent, George K. Burgess, Cloyd Chapman, C. L. Collins, Howard Coonley, L. A. Downs, Bancroft Gherardi, F. E. Moscovics, W. J. Serrill, C. E. Skinner, Matthew S. Sloan, and R. J. Sullivan.

SILK WEIGHTING STANDARDS REQUESTED

Upon formal request of the American Home Economics Association, the A. S. A. has authorized the calling of a conference of manufacturers, dyers, distributors, consumers, and others concerned with silk weighting to consider the establishment of national standards for methods of determining and expressing the percentage of silk weighting and methods of labeling silk fabrics and garments to give the consumer reliable and understandable information concerning the weighting.

BOLT, NUT, AND RIVET PROPORTIONS

A new subcommittee of the A. S. A. sectional committee on the standardization of bolt, nut, and rivet proportions has been organized to formulate standards for socket head cap and set screws. Consideration of technical details of the subject to be covered has been started.

WEATHERPROOF WIRES AND CABLES

Technical committee No. 12, of the A. S. A. sectional committee on wires and cables have prepared a draft, on specifications for weatherproof wires and cables, which also contains a section on heat-resisting wires and cables. Copies of the draft are available at the American Standards Association office, 29 West Thirty-ninth Street, New York, N. Y., for loan to those interested. This report takes up in detail the covering, the size of conductor, and the saturating compound for weatherproof wires. The drip, bending, and melting tests of the saturated cable are explained in some detail. The draft contains a table of weights given in pounds per 1,000 feet of cables varying in size from 250,000 to 1,500,000 cir. mil. The section relating to heat-resisting wires and cables gives the flame-proofing test and other material on fireproof cable.

SHAFTING

The A. S. A. sectional committee on the standardization of shafting is now revising four of its standards. The present standard for Cold-Finished, Standard Diameters and Lengths, B17-a, is being revised to include an extended range of shafting diameters of 6½, 7, 7½, 8, 10, 12, 14, and 16 inches. In the case of the standards for Standard Widths and Heights of Square and Flat Stock Keys, B17-b, Square and Flat Plain Taper Stock Keys, B17-d, and Square and Flat Gib Head Taper Stock Keys, B17-e, the revisions introduce the use of a ⅝-inch square key and a ⅝ by ¼ inch rectangular or flat key for use on shafting diameters ranging from 1¼ to 1⅜ inches.

WIRE AND CABLE NOMENCLATURE

As a part of their comprehensive program on specifications for insulated wires and cables (C-8) the American Institute of Electrical Engineers has submitted to the A. S. A. its standard No. 30 covering terminology and certain methods of test for electric wires and cables.

DRY CELLS

The A. S. A. sectional committee on this project is preparing revisions which relate to the A. S. A. standard C-18-1928 and to Federal specifications No. 58-a, Dry Cells and Batteries.

A. S. A. INTERNATIONAL ELECTROTECHNICAL COMMISSION RELATIONS

The United States Committee of the International Electrotechnical Commission and the American Stand-

ards Association have appointed conference committees to develop closer working arrangements between the two organizations.

SCIENTIFIC AND ENGINEERING SYMBOLS

The A. S. A. sectional committee on this project is circulating a draft of the proposed tentative American Standard Abbreviations for Scientific and Engineering Terms, prepared by the subcommittee on abbreviations. The draft includes about 285 abbreviations.

SWITCH BOXES AND OUTLET BOXES

The Underwriters' Laboratories have submitted for A. S. A. approval their specifications for outlet boxes. These are a part of an extensive project on electrical devices and materials with relation to fire and casualty hazards for which the Underwriters' Laboratories hold sponsorship.

STANDARD TERMS ELIMINATE WASTE

By T. H. HICKS, *Rear Admiral, Supply Corps, United States Navy, Chairman Federal Standard Stock Catalogue Board*

The greatest project of construction in ancient times—the Tower of Babel—was frustrated by the confusion of tongues. Man power and materials were still available and the motive and design were unchanged; but when the builders' plans and instructions could no longer be communicated from one to another, accomplishment became impossible and the work had to be abandoned.

We are all familiar with the difficulty experienced by the average American business man in his dealings with foreigners. Even in transactions between this country and England obstacles are encountered because of the variances in usage of the same language. But few people realize how great is the loss of effort in dealings between one American and another due to misunderstandings that arise from different uses of the same terms.

The very richness of the English language in synonyms is a source of constant trouble in the transaction of business. With the options offered in the use of words, specialized vocabularies have grown up that vary from one industry to another and even from one individual to another. This is true in many lines of endeavor, but applies in a most disadvantageous manner to the names given items of supplies and materials that make up the bulk of everyday business dealings.

Another result of the flexibility of the English language, which is equally important, is the general tendency to inexactness in the descriptions of articles. Frequently essential information is lacking in urgent and important business communications.

In consequence of the difficulties mentioned, efforts to convey information, instructions, etc., in the business world are almost as arduous as though the various persons concerned were employing different languages. Thus the confusion of tongues has persisted insidiously long after the incident of the Tower of Babel.

That misunderstandings cause delays and voluminous correspondence, everybody knows. While often the cause of considerable exasperation, most people look upon them as a necessary, although undesirable, component of business procedure. It is hard to estimate the losses in dollars and cents of wasted effort through misunderstandings, but reflection will show that the grand total must be great. How many other great projects unrecorded in history have been abandoned on account of this selfsame obstacle?

As an illustration of the existing variation in names for an identical article in each case, let us take a paint ingredient in common use. It is known commercially as—

- | | |
|---------------------|---------------------|
| 1. Barite. | 4. Blanc fixe. |
| 2. Barium sulphate. | 5. Heavy spar. |
| 3. Barytes. | 6. Permanent white. |

Many other similar cases could be cited. It is easy to understand how delays and errors in supplying material are occasioned frequently by the inability of the supplier to determine what is wanted.

It is true that many attempts have been made to overcome the difficulties described, but these endeavors have been confined, for the most part, to a

particular industry or part of an industry. The Government has not been unaware of the possibilities of increased efficiency through the adoption of standard nomenclature and descriptions.

On March 29, 1929, Circular No. 260, Bureau of the Budget, was issued, establishing under the supervision of the Chief Coordinator, a Federal Standard Stock Catalogue Board, with representation from all of the departments and the larger establishments. The duty was assigned the board to determine the articles to be included in a Federal Standard Stock Catalogue for the use of the several departments and establishments, together with information relative to nomenclature, descriptions, classifications, groups, specifications, stock numbers, code words, and other pertinent data, and to decide questions of arrangement and other considerations that may arise in connection with the compilation of the catalogue.

The Federal Standard Stock Catalogue is designed to list in orderly and classified arrangement all supplies regularly procured, stored, and issued by or for the various departments and establishments of the Government, and to furnish in the case of each item of such supplies the information necessary for procurement, storage, and issue. It is limited in its scope to such supplies. It is intended that this catalogue, when completed, shall include all items of supplies and materials necessary to meet the ordinary requirements of the various departments and establishments, except in the case of specialized technical materials, and requirements should be so regulated as to avoid, so far as practicable, orders or requisitions for articles that do not appear in the catalogue.

The catalogue will comprise the following sections:

I. General index of Federal property.—Listing in alphabetical arrangement each item of supplies regularly procured, stored, and issued by or for the various departments and establishments, and indicating the class for storage and issue, the group for procurement, and the Federal Specification applying thereto.

II. Classes for storage and issue.—The criteria of classification being similarity of application of storage requirements. There is listed in alphabetical arrangement under each class each item of supplies regularly stored and issued by or for the various departments and establishments, specifications, standard nomenclature, stock numbers, data as to departments by which used to facilitate interdepartmental transfer of supplies, approximate prices, and code words to facilitate the placing of orders by radio or telegraph in the case of each item. This section also embodies storage notes and stowage precautions.

III. Groups for procurement.—Each group representing a major division of productive industry. These groups are in turn subdivided into divisions conforming to the general trend of specialization in industry. There is embodied detailed information re-

quired by Government procurement agencies as to geographic distribution of sources of supply, variation in practice as to production or marketing and other data requisite for economical and expeditious procurement.

IV. United States Government master specifications.—The technical requirements are mandatory upon all executive departments and establishments. The index has been arranged in two forms—alphabetical and numerical.

Throughout the various sections of the Federal Standard Stock Catalogue standardized and uniform nomenclature is used.

While prepared primarily for the Government service, it is believed that its usefulness could be extended to the commercial field. For this reason it is planned to have copies of the catalogue—either complete or in sections—made available for sale through the Superintendent of Documents, Government Printing Office.

As the assignment of nomenclature to the items comprised in the catalogue is based on a truly scientific system, it is believed that its adoption as a standard will be welcomed by industry and will have a widespread and beneficial effect in the commercial field.

The importance of exactness and uniformity with respect to nomenclature can not be overemphasized. With a single standard of nomenclature in general use, the transactions of individuals, firms, industries, and the Government—both inside and outside their organizations—would become immeasurably more efficient and economical.

The Government's requirements in the way of supplies and materials cover a very great variety. This is reflected in the catalogue by the segregation into 81 classes for storage and issue of the upward of 60,000 items it will list. Furthermore, this is shown by the fact that these commodities are obtained from 61 main groups of industry which are further subdivided wherever specialization in industry has developed.

Comparatively few articles peculiar to the sole uses of the Government are shown in the catalogue and the great majority of articles are those in common use by most lines of business, both large and small. Specialties are not included, but, even where a firm makes a specialty, it will find in many cases that the items entering into the manufacture of its product are included in the catalogue and it will be of value to the firm on that account.

What is true of standard nomenclature and descriptions applies with equal force to standard stock numbers and code words. These are provided by the catalogue.

The catalogue will perform a service for the Government and the commercial field in addition to and quite distinct from the features already described.

The division of simplified practice, Bureau of Standards, of the Department of Commerce, has for several years been carrying on a broad program of assisting American industries to reduce the extensive wastes which now result from unnecessary varieties in shape, size, classification, or any characteristic or process connected with products. This work has been in the form of simplified practice recommendations by which the division has aided the interested producers, distributors, and consumers to establish. These recommendations have been widely accepted by those concerned and have proved of the greatest value in giving better service at less cost. The program has received the enthusiastic indorsement of everyone familiar with it.

The Government has adopted these simplified practice recommendations except where special technical requirements prevent. The Government has also done much simplification on its own account. As a result, many of the lists of particular items in the catalogue will appear on first inspection to be incomplete, as they cover in some cases less than half of

the usual stock range. Experience, however, has shown that these simplified lists will take care of every reasonable need and do it more economically by reducing stocks and facilitating replenishment. So the catalogue will perform a valuable service in making readily available to the Government and the commercial field the proved results of many simplification projects.

One object of great importance in the publication of a Federal Standard Stock Catalogue is to fill a vital need of the Nation for such an authority in case of war. Many of the almost insurmountable difficulties encountered during the World War would be resolved by the application of standard nomenclature in the manufacture, transportation, and issue of supplies in any future national emergency. Industry would then be familiar with the Government's needs and be prepared to meet them with the least delay and confusion.

Since its creation, the board has undertaken actively the work of compiling the Federal Standard Stock Catalogue, and it has been advanced to a point where several of its sections can be published within the next few months.

TECHNICAL AND PRACTICAL TRENDS IN CONSTRUCTION ¹

By JOHN M. GRIES, *Former Chief, Division of Building and Housing, Department of Commerce*

No one can deny that during the postwar period there has been a tremendous advance in planning and carrying out road-building projects and other large engineering undertakings. In the case of buildings, particularly small houses, where the greatest criticism has been directed, distinct improvements do not wholly dispel the charge that the building industry has failed to keep pace with other groups in modernizing its methods. But the groundwork laid by the tendencies for construction to follow nation-wide, rather than purely local, standards undoubtedly forms a necessary basis for further advances.

GROWTH IN PROFESSIONS

One indication of the increased appreciation and use of engineering data and technical skill is the growth in membership of professional societies, such as the American Society of Civil Engineers, the American Institute of Architects, and the American Society of Heating and Ventilating Engineers, several of which have more than doubled in membership since 1913, and some since 1919. There has also been a notable increase in the technical activities of trade associations in the construction industries, and in national and local cooperation between groups.

MORE CAREFUL DESIGN

Structures are commonly planned more carefully for adaptability to use and economy in construction. For large structures the architects often collaborate with committees of experienced building managers. Architectural and engineering firms, assigning more important rôles to cost engineers, consult more often with contractors on economical features of design. Much construction is carried on by public utilities and large corporations, such as chains of stores and motion-picture theaters, which employ specialists who work out plans with great refinement. Some of the larger mortgage bond companies also employ architects to pass on the design of structures and to suggest desirable improvements. Improvements in small-house design include better lighting, heating, heat insulation and ventilating, economy in the use of materials, regard for efficient construction methods, and for durability and appearance of the finished structure.

RESULTS OF COMPETITION IN BUILDING MATERIALS

Competition between the producers of various types of building materials has been keen, with many millions of dollars spent for group and association advertising and other forms of promotion, research, and engineering service. Quick-setting cements and mortar

¹ From Chapter III in *Recent Economic Changes in the United States—Report of the Committee on Recent Economic Changes of the President's Conference on Unemployment*, pp. 232-235.

materials, wall boards, composition strip shingles, quick-drying lacquer paints, materials for heat insulation and sound deadening, and the evolution of dozens of varieties of floor, wall, and roofing materials illustrate the trends.

National trade associations, with annual budgets for research and promotion work running into the hundreds of thousands of dollars, are active in encouraging the use of Portland cement, lumber, steel, brick, hollow tile, and other materials. Building material retailers more and more have had to carry nationally advertised commodities and brands in order to meet the wishes of customers.

STANDARDS FOR MATERIALS

Great savings have been effected in the use of materials through more careful analysis of strains and stresses, wider use of specifications, and better inspection, which permits greater reliance on uniform quality. There is a distinct and steady trend toward thinner masonry walls and lighter structural elements.

The American Society for Testing Materials has adopted many new specifications for building materials.

The transforming of construction from a local to a more nearly national basis has been reflected in and stimulated by the adoption of simplified practice recommendations, which have recognized standard dimensional varieties for about 50 building material items, including yard lumber, common brick, hollow tile, concrete building units, metal lath, and builders' hardware.

A standard filing system, established in 1916 by the American Institute of Architects, is finding wider use by manufacturers of materials.

DURABILITY

Increased durability of structures is emphasized by attention to fire-resistive features and use of noncorrosive metals. The amount of wood treated with preservatives to lengthen its useful life doubled from 1922 to 1927. The subgrading and substructure of highways is more carefully prepared, and the surfacing more lasting.

BETTER ORGANIZATION AND REDUCED TIME FOR CONSTRUCTION

The execution of many more contracts of large size has been accompanied by improvements in the organization of many contracting firms. The time required for executing practically all types of construction operations has notably diminished, a development stimulated during the war and made possible by better planning and scheduling of work, improvements in design, increased shop fabrication of materials, more dependable delivery of materials, and wider use of labor-saving devices and equipment on the job.

Groups of subcontractors have developed highly specialized organizations and their relations with contractors and designers have tended to become closer.

IMPROVED MACHINERY

Labor-saving machinery has been made more adaptable and reliable, and is more widely used. Development of the gas engine has had a widespread influence. Motor trucks have left to horses only a small share of the hauling of materials, and have also cut into the use of light railways for filling operations. Gas engines have made possible a much wider use of compressed air furnished by small portable motor-driven units, and they and electricity are displacing steam in power shovels. The motor truck with its self-dumping body is displacing the wheelbarrow and common labor, in the assembly of materials in the hoppers and skips of concrete mixers and pavers. Standardization of ratings of capacity, and other features of mixers and pavers, has been effected by the cooperation of the manufacturers who in 1923 organized the Mixer Manufacturers Bureau, affiliated with the Associated General Contractors. This now represents nearly 100 per cent of the machine capacity in both classes of mixers. The greater mobility and capacity of motor trucks have stimulated the use of power shovels on a greater number of jobs and kept larger shovels at work a greater portion of the time.

Many devices have been perfected for cutting down labor at the building site, particularly in the use of concrete and masonry materials, where there are material-handling problems.

Field studies show a more general rental of construction machinery and equipment, even by the large contracting firms. This practice has tended to reduce overhead carrying costs and transportation charges, and has encouraged and made available at less cost the use of the most efficient types of equipment.

PUBLIC REGULATION

The modernization of municipal building regulations has been accelerated. The enactment of zoning ordinances in more than 700 municipalities has already been mentioned.

The Department of Commerce Advisory Committee on Building Codes has been at work since 1921 on recommended requirements for municipal codes, co-operating with many other groups. Its findings have been used in code revisions in at least 120 municipalities.

National trade associations have extended their work of securing fair treatment for their materials in building codes. Several new associations have appeared in this field.

The Building Officials' Conference has gained in membership and strength. Corresponding regional bodies have been formed. Altogether, the framing

and administration of building codes has come to be more widely recognized as a serious problem, to be solved by scientific research and engineering skill.

NORTH EUROPEAN PRODUCERS PROPOSE STANDARDIZED MOLDINGS

Representatives of the lumber export organizations in Finland, Norway, and Sweden, as well as of the Norwegian and Swedish standardization committee, held a meeting in Stockholm, when sawn lumber standardization was discussed. It was agreed in principle to use similar moldings for planed lumber in the export trade. This agreement, which requires the confirmation of the boards of the various organizations, stipulates that the Norwegian moldings are to be used in all thicknesses, except that of five-eighths inch, for which dimension the Swedish molding is to be used.

With regard to the application of a common length measure for sawn and planed goods, those at the meeting decided to approach the English Standardization Commission with a view of securing its assistance in establishing this length measure. The length measure would thus be observed in sales both in England and to the continental markets; in the first place, France and Belgium, where the goods are measured in metric feet. It was further decided that the export organization in the northern countries, on receiving the reply from the English committee, should do their best to expedite the settlement of this important matter.

The sizes and patterns of Norwegian standards of planed lumber for export are shown in the Department of Commerce publication, Special Agent Series No. 211, *The Lumber Industry in Norway* (1922). Special Agents Series No. 211, which also covers the forest resources and export trade of Norway, may be secured from the Superintendent of Documents, Washington, D. C., or from any of the district or cooperative offices of the Bureau of Foreign and Domestic Commerce,

for the price of 30 cents. There is no information immediately available on the pattern of the five-eighths inch Swedish molding.

RECENT CHANGES IN BUREAU

Edwin W. Ely, who has been acting chief of the division of simplified practice since the promotion of Ray M. Hudson to Assistant Director of the Bureau of Standards in charge of the commercial standardization group, has been appointed chief of the division. At the same time the following promotions were also announced: I. J. Fairchild to be chief, division of trade standards; Dr. A. S. McAllister to be chief, division of specifications; and H. S. Rawdon to be chief, division of metallurgy.

FEEL LACK OF STANDARDIZATION

In his opening address delivered before the Twenty-sixth Annual Convention of the American Road Builders' Association at Cleveland, Ohio, R. Keith Compton, president of the association, said that "there has been a lack of standardization and coordination of construction and administration functions among municipalities. There are numerous sets of specifications, numerous methods of applying them, and coordination is sadly lacking." In closing his remarks on this subject he suggested that "further efforts be made toward the simplification and standardization of various features of road-building machinery and equipment, such as nomenclature, terminology, ratings, and capacities; also, as far as practicable, the standardization of sizes and dimensions of items, such as dump bodies, shovel buckets, and other equipment. The general idea, of course, being the further interchangeability and ease of replacement in those parts calling for highest frequency of renewal. In these matters we must have the cooperation and assistance of the manufacturers."

WOOD UTILIZATION PROGRAM SHOWS PROGRESS

Approximately 600 Maryland sawmills and wood-working plants are cooperating with the National Committee on Wood Utilization in its survey of wood waste in that State. If conditions in other States may be taken as a criterion, thousands of tons of wood in Maryland—potential raw material for paper and pulp mills, fiber, box, and furniture factories, and similar industries—are annually burned up for want of a better outlet. The information obtained from this survey will show the character, kind, quantity, and exact locations of the nonutilized wood available in the State. Similar surveys conducted by the committee have developed the fact that more than 60,000 carloads of wood waste are annually available in those States.

Over 10,000 copies of the booklet "You Can Make It," published by the committee as a part of its effort to put old boxes and crates to good use, have already been sold.

A newspaper in Birmingham, Ala., is staging an arts and craft contest and has purchased 300 of these bulletins to present to the boys and girls entered in this contest. One box company alone has ordered 4,500 copies.

"Seasoning, Handling, and Care of Lumber" (Manufacturers' Edition), is the title of a bulletin released by the National Committee on Wood Utilization early in July. The object of this bulletin is expressed in the opening paragraph of its foreword, which reads:

Probably no other measure will so greatly increase the usefulness of lumber as its proper seasoning, not only because the seasoned stock is increased in strength from one to three times as compared with green lumber but also because its lasting qualities are enhanced and charges for freight and handling costs are greatly reduced.

The report points out in a purely suggestive way the various methods of producing properly seasoned lumber. Yard layouts, methods of handling, and yard seasoning are also discussed. Briefly, the bulletin is a summary of the methods employed by manufacturers of practically all the commercial wood species of importance in the United States. The price of this bulletin is 30 cents. It may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C.

Attention is especially directed to the fact that this is the fourth and last of a series of bulletins on the same general subject, the first three of which were written for the lumber consumer, the lumber distributor, and the lumber fabricator, respectively.

The cutting of lumber less than 13 inches in diameter with the type of machinery used in American mills has heretofore been unprofitable. Because of this fact the committee is sponsoring a test of Scandinavian gang saws, which have proven very efficient in European sawmills, and which are designed especially to cut small logs. This test, which is under way in Pacific coast mills, has already demonstrated that miscuts and scant lumber are practically eliminated where timber is cut with the Scandinavian type of machinery. This insures to the trade, lumber which conforms to American Lumber Standards. Furthermore, the surface of boards sawn with the Scandinavian gang saw is such as to preclude the necessity of planing and surfacing them after they are cut. The tests have shown conclusively that the gang-saw type of machinery is very well adapted to the cutting of the species of timber grown on the West Coast, particularly Douglas fir.

The decrease in the stands of merchantable timber located near our large fabricating centers and consequent increasing transportation costs of rough lumber have brought to the attention of the lumber industry the economic importance of the use of small-dimension stock cut to size at or near the source of supply and 100 per cent usable for those industries which fabricate and assemble the finished product.

To make available the latest information concerning small-dimension lumber, the National Committee on Wood Utilization has prepared a bulletin under the title "Small Dimension Lumber, Its Seasoning, Handling, and Manufacture," which will soon be ready for distribution.

The objects of this bulletin, which summarizes the methods followed in plants producing in excess of a billion board feet of small-dimension stock per annum, are threefold: (a) To summarize present conditions

in the small-dimension industry; (b) to present to the manufacturer and to the prospective operator a summary of what are considered the best practices of manufacture, seasoning, and handling, as applied to small-dimension stock; and (c) to discuss the important subjects of cost finding and standardization as applied to small-dimension stock.

INDUSTRIAL ORGANIZATIONS

Commercial and Industrial Organizations of the United States is the title of the 1929 edition, issued by the United States Department of Commerce. In it are listed more than 13,000 trade associations and nonprofit organizations, an increase of nearly 50 per cent over the 1926 edition. The book is valuable for locating the association representing any industry, its address and secretary's name. Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C. The price is 60 cents per copy.

DEVELOPS METHOD FOR PREPARING GAS-FREE LIQUIDS

An improved method for removing and collecting dissolved gases from liquids has been developed. It has been found, for example, that under proper conditions, the amount of oxygen dissolved in water may be reduced to less than 0.0001 per cent by only one sublimation. Ammonia, carbon dioxide, and many other gases may be completely removed from liquids. This is of importance in accurately determining the vapor pressure, conductivity, and density of pure liquids.

The investigation was conducted at the Bureau of Standards, where it was discovered that, through the principle of vacuum sublimation, gas-free liquids could be prepared without appreciable loss of either liquid or dissolved gas. These liquids are used in the determination of physical constants, one of the primary functions of the bureau. This subject was treated more fully in the July number of the Bureau of Standards Journal of Research.

CONCRETE REINFORCING BARS TESTED

In an effort to find a method of making the cold-bend test of uniform severity for concrete reinforcing bars of all sizes and degrees of hardness, and the finding of an impact test suitable for detecting brittleness in such bars, a series of tests has been made at the Bureau of Standards.

A standard test for quality of concrete reinforcing bars consists in bending the bars, without heating, through 90° to 180° with a radius of bend equal to 1, 2, or 3 diameters of the bar. The angle and radius of the bend depend generally upon the size and hardness of the bar. The difference in the angle and radius of the bend required for different types of bars

causes differences in the severity of the tests applied to the different bars. Thus it seems that the tendency is to suit the specification to what the bars of different grade will meet successfully rather than to the service demanded of the bars in bending for use as reinforcement.

In the tests made on bars purchased in the open market it was desired to find out also whether the application of the cold-bend test might impair the tensile strength although the bar did not fail in the bend test. Cold-bend, tension and impact tests were made. The cold-bend tests were made by the standard methods and by means of an improved machine designed and built at the bureau. Bars which did not break in the cold-bend test were not seriously affected as to strength by the bending. With the special bending machine used, all bars, regardless of their size, appeared to undergo about the same strain when bent through the same angle. The apparent yield point in the bending test was much higher than the yield point determined in direct tension test. The impact test used gave an approximate measure of the yield point of the bar, but none of the bars broke in the impact test except a few which had been quenched in water from a high temperature.

STEEL RAIL STRESSES BELIEVED WELL WITHIN ENDURANCE LIMIT

As the result of extended tests on rails subjected to heavy service conditions, the Bureau of Standards has concluded that the steel in these rails had not been subjected to stresses greater than its endurance limit, and that fatigue failures in service arise from pre-existent nuclei.

This investigation is in line with the policy followed by the bureau for many years, of cooperating with railroads and manufacturers in problems relating to the betterment of railway equipment, with particular reference to improving the safety of travel.

It has long been recognized that the so-called transverse fissure type of rail failure was of the fatigue type, the result of the repeated stressing of the rail by the passage of trains. The failure always spreads from a well-defined nucleus in the interior of the head of the rail. The origin of this nucleus has never been definitely established. It is thought by some investigators to be present in the rail before placing in service, but by others to originate in service due to excessive wheel loads.

Recent developments in the endurance or fatigue testing of metals has made possible the determination of the stress, called the endurance limit, to which a metal, such as rail steel, may be repeatedly subjected without causing failures. Tests to determine this value for new rails from several different heats of steel have been previously reported at the bureau in *Technology Paper No. 363*. In those tests of new rails it

was shown that service stresses might increase or decrease the fatigue resistance of the rail steel according to whether the service stresses, the exact values of which are not at present determinable, were less or greater than the endurance limit of the steel.

Through the cooperation of the Baltimore & Ohio Railroad and the Canadian Pacific Railway, rails from the same heats previously tested were taken out of track and returned to the bureau after having been subjected in some cases to over 20,000,000 tons of traffic in about one and a half to two years' service.

A redetermination of the endurance limits showed that the stresses imposed in service had not affected the endurance properties of the steel, the endurance limit being practically the same after as before service.

REALTORS ARE URGED TO ELIMINATE WASTE

The substitution of efficient, economical methods for present "wasteful" practices employed in the real estate business was urged by Edward A. Filene, president of William Filene's Sons, of Boston, before the annual convention of the National Association of Real Estate Boards, held in Boston.

"To-day," he said, "modern business is in a period of supercompetition for the consumer's dollar. Whole industries are competing with each other for the consumer's business. In this ceaseless competition the elimination of waste and the corresponding increase in good will play a most important part, and at present the real estate business is a weak competitor because of its deficiencies in these two essentials."

SCREW-THREAD STANDARDS COMPRISE TWO SERIES OF THREADS

The 1928 edition of the Report of the National Screw Thread Commission has recently been released for distribution, and may be secured from the Superintendent of Documents, Government Printing Office, at 50 cents per copy. It is published as Miscellaneous Publication, Bureau of Standards, No. 89.

As the *COMMERCIAL STANDARDS MONTHLY* is expected to reach a large number of readers who are not familiar with the work of the Screw Thread Commission, a rather extensive outline of the work of the commission is given herein.

The commission was established in 1918 by act of Congress; its life was twice extended by subsequent acts, and in 1926 it was made a permanent body.

The commission is composed of 9 members appointed as follows: The Director of the Bureau of Standards is ex officio chairman of the commission; 2 members are appointed by the Secretary of War, 2 by the Secretary of the Navy, and 4 by the Secretary of Commerce; 2 of the latter are from nominations made by the American Society of Mechanical Engineers and 2 from nominations made by the Society of Automotive Engineers.

The duties of the commission as set forth in the act are—

* * * to ascertain and establish standards for screw threads, which shall be submitted to the Secretary of War, the Secretary of the Navy, and the Secretary of Commerce for their acceptance and approval. Such standards, when thus accepted and approved, shall be adopted and used in the several manufacturing plants under the control of the War and Navy Departments, and, so far as practicable, in all specifications for screw threads in proposals for manufactured articles, parts, or materials to be used under the direction of these departments.

It is thus seen that the screw-thread standards adopted and promulgated by the Screw Thread Commission are mandatory only upon certain departments of the Federal Government. The commission has, however, had the fullest cooperation of engineering societies, standardizing bodies, manufacturers and users of screw threads, threading tools and gages, and the standards established by the commission have been accepted by industry, to such an extent that they have become in fact, as well as in name, American National Screw Thread Standards.

The screw-thread standards as established by the commission comprise two series of threads, a coarse-thread series corresponding to the old "U. S." series, and a fine-thread series corresponding to the S. A. E. series. A complete classification of fits, with limiting dimensions and tolerances for each class, is also established.

The report also contains information on pipe threads, fire-hose threads, small hose threads, Acme threads, threads for electric fixtures and fittings, electric-lamp bases and sockets, cutting and welding torches, wood screws, tap drills, threading tools, gages, and methods of measurement.

Three reports have been issued by the commission, the first, or Progress Report, in 1921, the second in 1924, and the third, known as the 1928 Report, was issued in June of this year.

In the new report the thread series and basic dimensions are essentially the same as in the earlier editions. The new report, however, is completely revised, rearranged, and much new material has been added.

Among the important changes and additions the following may be mentioned: The fine-thread series has been extended from $1\frac{1}{2}$ to 3 inches; the section on special threads has been revised for greater convenience in use; a 12-pitch series of threads, tentative specifications for class 5, wrench fit, dimensions and tolerances for bolt heads, nuts and wrench openings, threads for cutting the welding torches, and specifications for gage blanks for plain and threaded plug and ring gages have been added, and the sections on threading tools, tap drills, and gages have been revised.

The 1928 report will also be published in several sections as a series of commercial standards. The first three sections will cover the following:

1. Regular fastening screws, bolts, and nuts, coarse and fine thread series, dimensions and tolerances for class 1, 2, 3, and 4 fits.
2. Screw threads of special diameters, pitches, and lengths of engagement.
3. Gage blanks for plain and threaded plug and ring limit gages.

TURNING WITH SHALLOW CUTS AT HIGH SPEED

Up to the present time, the only generally accepted method of test for lathe tools has been a life test under heavy duty—that is, under deep cuts and coarse feeds. However, these tests are known not to be representative of a large part of industrial turning operations for which adequate methods of test have not been developed.

This report describes a new method of test for lathe tools to be used under shallow cuts and fine feeds. It is based upon the fact that when two tools are set at equal depth in the same tool holder, the second, or "trailing," tool will not cut so long as the leading, or test, tool shows no wear.

This method of test was first used in a study of the conditions of cutting including variations in cutting speeds, feeds, depths of cut, and the presence or absence of cutting liquids; tests were also made with tools of different form and with tool steels of different compositions heat treated in various ways. The tests were made throughout a period of about three years and included over 1,000 tools.

The performance of carbon and low-alloy tool steels and chromium-tungsten-vanadium (high-speed) steels was studied by means of the new method of test, and the results compared with those obtained in the heavy-duty tests. It was found that composition variations which were beneficial for the one type of service were not necessarily so for the other.

Both the new test and the customary heavy-duty test were applied to high-speed steel containing additions of arsenic, antimony, copper, tin, cobalt, nickel, molybdenum, aluminum, titanium, tantalum, high phosphorus, and high sulphur. Of these 12 elements only 1, cobalt, produced decidedly beneficial results. Two others, molybdenum and nickel, offered promise under certain conditions while the balance either had a negligible effect or were definitely deleterious from one viewpoint or another.

The extent of the experiments seems to justify the conclusion that the new method of test is a useful addition to those previously available for comparisons of lathe tools under conditions approaching those of practical service. The new method can readily be applied in almost any machine shop since the only special equipment required is a special tool holder which is neither expensive nor complicated in construction.

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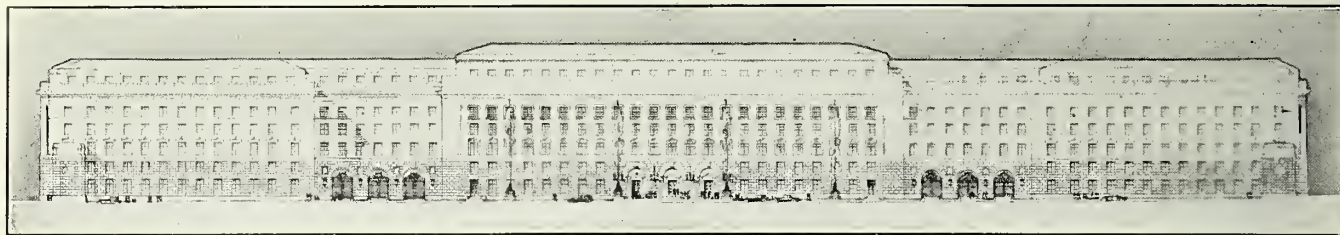
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—President Hoover, at the laying of the corner stone of the new building of the U. S. Department of Commerce, June 10, 1929.



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